

# PATENT SPECIFICATION

951,101

DRAWINGS ATTACHED.

Inventor :—JOHN HERBERT BUSHILL.

Date of filing Complete Specification : July 4, 1960.

Application Date : May 6, 1959. No. 15524/59.

Complete Specification Published : March 4, 1964.

© Crown Copyright 1964.

951,101



Index at Acceptance :—F2 V(D3, D4X, D5C, D5X, E1L2, M1L2); F1 R(3A3D, 3B12).

International Classification:—F 06 k (F 05 d).

## COMPLETE SPECIFICATION.

### Improvements in and relating to Fluid Control Valves.

We, J. LYONS & COMPANY LIMITED, a British Company, of Cadby Hall, London, W.14, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to fluid control valves and more particularly to such valves suitable for use with containers the contents of which are fluids under pressure. The invention is concerned with the provision of a valve which operates satisfactorily, and especially one which is suitable for use with materials, such as food stuffs, where it is desirable that there should be a minimum quantity of the contents exposed after the valve has been used. This is especially so where the contents of the container are of a nature which will cause them to deteriorate in contact with air.

The invention consists broadly of a fluid control valve comprising a body member having an opening in it, and an annular resilient member secured adjacent said opening, a closure member having a rigid generally domed portion mounted by resilient means with respect to the body member, said closure member being adapted to move between a position in which said domed portion engages and seals against the aperture in the resilient annular member, to close said opening, and a position in which the domed portion is out of engagement with the resilient member, to permit fluid to pass through the opening and through the space between the aperture in the annular member and the domed portion, the domed portion of the closure member being constrained by said resilient means against substantial movement in a direction transverse of the

direction of movement between the two said positions.

The present invention will be more readily understood from the following description of one embodiment thereof, given by way of example, in conjunction with the following drawings of which Figures 1 to 4 accompany the Provisional Specification and of which Figure 5 accompanies the present Specification :—

Figure 1 is a vertical transverse section through a valve in accordance with the invention;

Figure 2 is an under plan of the valve shown in Figure 1;

Figure 3 is a vertical transverse section of the actuating means for the valve;

Figure 4 is an under plan of the actuated mechanism shown in Figure 3; and

Figure 5 is a fragmentary vertical transverse section through the upper part of a container fitted with the valve and an actuator in position, and showing a modification of the valve.

The valve construction shown in Figures 1 and 2 comprises a metal body member which is shaped to fit in the opening in the upper part of a suitable container, not shown. This member has a peripheral flange 10 by which it can be spun into engagement with the container opening, and a depending cylindrical portion 11; a resilient sealing member can be interposed between the container and the portion 11. A re-entrant part 12 of the body member has a central opening in it about which opening is a flange 13 forming a part of the body member. The flange 13 serves to secure a sealing member 14, of a resilient material such as synthetic rubber or the like, this sealing member 14 co-operating with a closure plate 15 which is

located at its periphery in a groove of the body member as shown. The groove can be formed by crimping the body member as at 16. The plate 15 is of flexible metal, and is shaped as shown in Figure 2. Also, the central part of the sealing plate is domed at 17, this dome engaging the edge of the sealing member 14. Normally, the tension of the plate 15 against the member 14, supplemented by the pressure which is maintained on the contents of the container, secures an adequate seal of the contents. It will be seen that the sealing member 14 provides a sharp edge which bears against the domed part of the plate, thus producing a high sealing pressure, and a well defined sealing area.

To release the contents of the container, it is necessary to apply a downward pressure to the domed part of the plate 15, and this is effected by an actuating member, shown in Figures 3 and 4. The actuating member is located within the upper part of the closure member as shown in Figure 5.

The actuating member is of a suitable plastic material, moulded to shape, and has a roughly cylindrical portion 20, from which extends laterally a finger portion 21. Within the cylindrical part 20 is a downwardly extending projection 22, the lower extremity of which is adapted to be brought into contact with the domed part of the plate 15, when pressure is applied to finger portion 21. The cylindrical portion of the actuating member is located in the body member by means of integral projections 23, which engage in corresponding recesses in the closure member.

When the finger portion 21 is depressed, the contents of the container will emerge from the opening in the body member, and after filling the cylindrical portion of the actuating member will emerge from the nozzle 24, formed integrally in the cap of the actuating member. Partly to promote an even flow of the contents from the nozzle, the nozzle has a cruciform opening in it, as shown in Figure 4.

The actuating member is formed with a downwardly extending tongue 25; this serves to prevent accidental operation of the valve when the container is in transit. Before use, this projection is broken off to allow the tongue 22 to operate the valve. As shown in Figure 3, the lower edge of the actuating member is inclined and this permits the actuating member to pivot about the fulcrum formed by the projections 23. The restoring force on the actuating member, when pressure is released, is obtained from the valve plate 15, and from the resiliency of the material of the member.

The valve shown in Figure 5 is also modified in one respect; the plate 15 is formed with two parallel corrugations 26 in order to alter the resiliency of the valve. These corrugations

are straight, and extend across the width of the plate 15.

The valve constructions described have the advantage that when the sealing members, such as 14, are made of heat-proof material, such as silicon rubber, it is possible for the filled containers, with the valves inserted, to be raised to a temperature adequate for sterilising. During this operation the actuating member can be removed if this is of a material which will not withstand sterilising temperature.

#### WHAT WE CLAIM IS:—

1. A fluid control valve comprising a body member having an opening in it, and an annular resilient member secured adjacent said opening, a closure member having a rigid generally domed portion mounted by resilient means with respect to the body member, said closure member being adapted to move between a position in which said domed portion engages and seals against the aperture in the resilient annular member, to close said opening, and a position in which the domed portion is out of engagement with the resilient member, to permit fluid to pass through the opening and through the space between the aperture in the annular member and the domed portion, the domed portion of the closure member being constrained by said resilient means against substantial movement in a direction transverse of the direction of movement between the two said positions.

2. A valve in accordance with Claim 1 wherein said body member is formed of sheet material and has an annular flange defining said opening, and said resilient member engages said flange, thereby to be retained in position on said body member.

3. A valve in accordance with Claim 2 wherein said flange is formed with an out-turned edge, further to grip said resilient member.

4. A valve in accordance with any one of the preceding claims, wherein said resilient member is shaped, at that part which engages the dome surface of the closure member, with a sharp edge thereby to increase the contact pressure between the resilient member and the closure member.

5. A valve in accordance with any one of the preceding claims, wherein said body member has a re-entrant generally domed portion.

6. A valve in accordance with Claim 5, wherein said sealing member is formed from a resilient material, and is supported at opposite points on the re-entrant portion of said body member.

7. A valve in accordance with Claim 6, wherein the sealing member is of strip form supported at its ends.

8. A valve in accordance with Claim 7,

wherein said re-entrant portion is shaped so as to retain the sealing member and hold it captive.

5 9. A valve in accordance with any one of the preceding claims, wherein said body member is formed integrally of metal, and is formed with a peripheral portion for securing directly to a container.

10 10. A valve in accordance with any one of the preceding claims, and including an actuating member for the valve having a portion retained near one end on said body member, an intermediate portion having a part for engaging the domed surface of the  
15 seating member, and a portion for engagement by the user to enable the said part to be depressed to operate the valve.

20 11. A valve in accordance with Claim 10, wherein the mounting of said one end of the actuating member is obtained by a co-operating projection and depression, one on the actuating member and one on the body member.

25 12. A valve in accordance with any one of the preceding claims, wherein the actuating

member serves as a cover for the body member, and has an opening for the egress of the fluid passing through the valve.

13. A valve in accordance with any one of the preceding claims, wherein the actuating member is provided with means to prevent  
30 undesired actuation of the valve.

14. A valve in accordance with Claim 13, wherein said means includes a frangible portion on said actuating member adapted to  
35 be broken off prior to use of the valve.

15. An improved valve construction substantially as described with reference to the drawings accompanying the Provisional Specification.  
40

16. An improved valve construction substantially as described with reference to the accompanying drawing.

A. A. THORNTON & CO.,  
Chartered Patent Agents,  
Northumberland House,  
303—306, High Holborn,  
London, W.C.1,  
Agents for the Applicants.

Abingdon : Printed for Her Majesty's Stationery Office, by Burgess & Son (Abingdon), Ltd.—1964.  
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2,  
from which copies may be obtained.

951101

COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

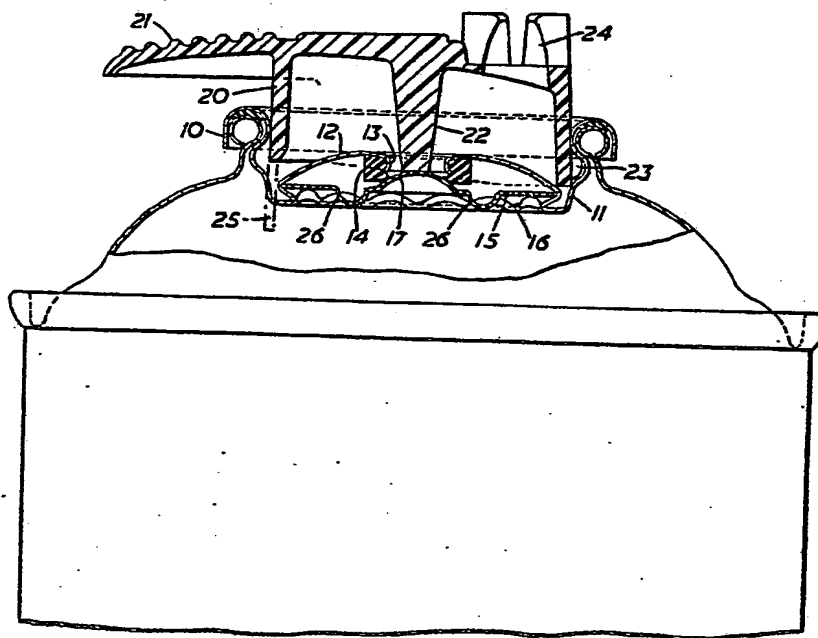


Fig. 5.

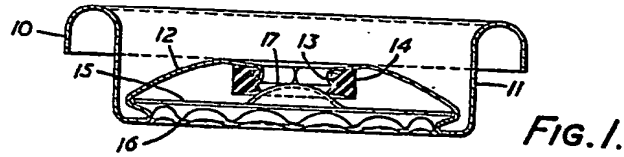


FIG. 1.

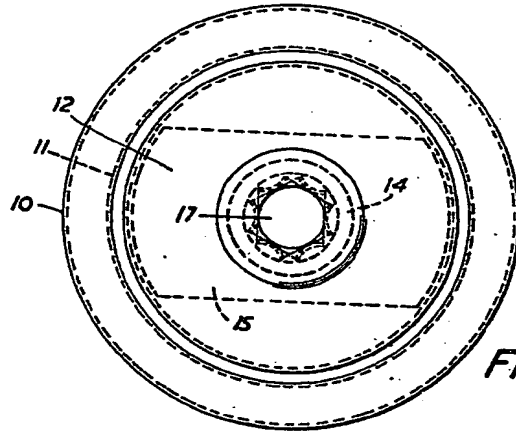


FIG. 2.

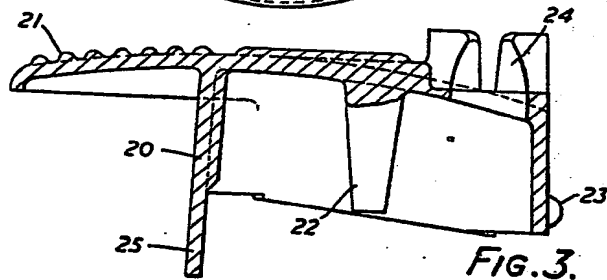


FIG. 3.

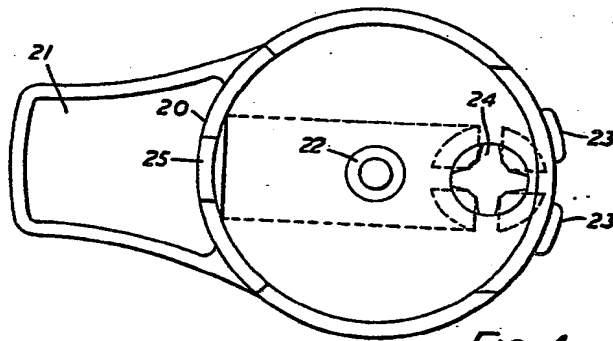


FIG. 4.